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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,986	10/29/2003	Masaharu Nagai	12732-171001	5334

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EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 05/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/694,986

Applicant(s)

NAGAI ET AL.

Examiner

Daborah Chacko-Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 12, and 19, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Amended claim 12, recites "irradiating the resist pattern with light within a range of photosensitive wavelengths of the photosensitizer after the first, second, and third dry etching processing". The specification does not support this limitation. The specification teaches irradiation of the resist residue left after the stripping process and in another embodiment teaches irradiation of the resist residue after the dry etching of one metal or gate electrode film. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-19, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication No. 2003/0228740 (Nagai et al., hereinafter referred to as Nagai) in view of U. S. Patent No. 6,009,888 (Ye et al., hereinafter referred to as Ye).

Nagai, in [0002], [0024], [0025], [0026], [0035], [0063], [0099], [0100], discloses a method of removing a resist pattern comprising forming a resist pattern of a positive resist, wherein the positive resist includes a diazonaphthoquinone photosensitizer (DNQ photosensitizer), developing the exposed resist, irradiating the resist pattern with light within a range of the photosensitive wavelengths of the DNQ photosensitizer, performing a dry etch process (on the material to be processed, film formed over the surface of the silicon substrate) using the resist pattern as the mask, and removing the resist pattern by a removing process (resist stripper, and ashing) to form a semiconductor device (claims 1-4). Nagai, in [0021], and [0025], discloses that the resist patterns include a DNQ-novolac resin type of positive resist, wherein DNQ is the photosensitizer (claims 5-8). Nagai, in [0099], [0100], [0103], [0104], discloses that the resist pattern is used as a mask to etch the gate electrode beneath the photoresist mask (claims 9-11). Nagai, in [0100], [0101], [0102], [0103], [0104], [0105], [0106], and [0118], discloses a method of manufacturing a semiconductor device comprising forming semiconducting layers over the substrate, depositing a gate insulating film over the semiconducting layer, forming a first gate electrode film so as to overlie the gate insulating film, depositing a second gate electrode film over the first gate electrode film (laminated metal layer, forming resist patterns over the gate electrode film (second), and irradiating the resist patterns performing a first dry etching process to form the

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second-layer electrode (second gate electrode), performing a second dry etching process in order to form the first-layer electrodes (first gate electrode), performing a third dry etching step in order to etch the first and second-layer gate electrodes, removing the remaining resist pattern (by ashing and stripping), wherein the first gate electrode and the second gate electrode possess a tapered side wall portion (tapered shape), and the first gate electrodes (reference 512c of figure 7B) extend beyond the second gate electrodes (reference 512b of figure 7B) after the third dry etch process (claims 12, and 13). Nagai, in [0117], [0118], discloses that the laminated metal film is formed on an acrylic resin film, wherein the laminated metal layers include titanium/aluminum/titanium (claims 14, and 15). Nagai, [0017], and in Table 1, discloses that the resist pattern is exposed to light for about 20 seconds (claim 16). Nagai, in [0021], and in Table 3, discloses that the resist pattern is exposed to light (irradiation processing of the resist pattern) for about 17 seconds (claims 17-19).

The difference between the claims and Nagai is that Nagai does not disclose irradiating the resist residuals, remaining on the pattern after the stripping process, with light. Nagai does not disclose that after the dry etch processes (more than one dry etch process) the resist pattern is irradiated with light.

Ye, in the abstract, and in col 5, lines 1-67, and in col 6, lines 1-35, discloses that after the dry etching processes and resist stripping processes, an irradiation is performed on the resist pattern and/or the resist residue remaining on the pattern structure formed (metal or insulating patterns), with laser.

Therefore, it would be obvious to a skilled artisan to modify Nagai by employing the method of irradiating the resist pattern after dry etch processes, and/or stripping processes as suggested by Ye because Ye, in col 4, lines 33-34, discloses that irradiating the residues remaining or photoresist pattern (remaining after dry etch processes) with laser is a synergetic effect that is superior to conventional strip processes, and in col 6, lines 25-26, discloses that laser removes all the polymers and resist remaining on the structure.

Response to Arguments

5. Applicant's arguments with respect to claims 1-19, filed March 3, 2006, have been considered but are moot in view of the new ground(s) of rejection. See paragraph no. 4.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

May 9, 2006.



JOHN A. MCPHERSON
PRIMARY EXAMINER